REPORT

ON THE

Propoſed Navigation

BETWEEN THE

EAST AND WEST SEAS,

SO FAR AS EXTENDS FROM

NEWCASTLE to HAYDON-BRIDGE,

WITH

OBSERVATIONS ON THE SEPERATE ADVANTAGES

OF THE

North and South Sides of the River Tyne.

BY WILLIAM CHAPMAN, ENGINEER, M. R. I. A.

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1795.

BRITISH MUSEUM

GENTLEMEN,

HAVING, in purſuance of your directions made a ſurvey of a line of navigation from Newcaſtle to Carliſle; and thence forward to ſuch a Port on the Iriſh Channel as ſhould appear moſt eligible: it remains for me to give you ſome particulars of the Country through which I paſſed; and of the advantages that may be attendant on any variation from the line I have ſurveyed; or on the adoption of any other.

Accordingly to what I recommended in my laſt report, I commenced on ſuch a level as will ſkirt the northern outlets of Newcaſtle with little inconvenience. The point of departure was the ſtep of the Leaſes Byer, which according to a ſurvey made by Mr. Fryer, at my requeſt, is nearly two hundred feet above neap tide high water; and the ſame level runs conveniently weſtward, paſſing northward of all the houſes in Gallowgate, and between the Lunatic Hoſpital and Mr. Gilfred Ward's houſe:—through the public gardens belonging to Mrs Stephenſon and Mr. Anderſon:—and acroſs the weſt turnpike road about thirty yards weſtward of the detached range of buildings on its ſouth ſide:—it then goes forward a little ſouth of Elſwick-Hall gardens:—and about three hundred yards below Benwell;—and paſſing cloſe to the weſt of Benwell-Lane Houſe, it turns northward towards the military road; and nearly within two hundred

yards of it, croſſes Denton Dean in a narrow part where the rivulet runs in rock, but at the depth of thirty-five or forty feet. In the line of Canal thus far, the ground is remarkably favourable; and the two deans of Benwell, ſo far from being any obſtruction; are, where the line croſſes, only of the depth and width requiſite to ſave the expence of excavation for the tunnels neceſſary to paſs the water of theſe rivulets. The line continues nearly the ſame diſtance from the military road until after paſſing Bell's Cloſe Dean; which is done without material difficulty;—thenceforward, the courſe lies above the Gate-Lodge on the road to Lemington; and ſweeping onwards in gently declining ground to the village of Walbottle (through which it paſſes), it goes over Walbottle Dean, where it is nearly fifty feet deep, but rendered of leſs moment by the nearneſs of its oppoſite banks; and from thence all the way forward to Horſely Dean the ground is very favourable, and *moderately declining*, which gives the means of the leaſt poſſible excavation and is preferable to the general run of flat grounds; as flats or planes unleſs horizontal in the line of the Canal, require, in a very moderate diſtance, either embanking or deep ſinking. And I ſhall here mention, once for all, that by far the major part of the line is under the preferable predicament above deſcribed.

Wallbottle Dean is croſſed about two hundred and fifty yards ſouth of the military road; the courſe then is nearly in a ſtraight line ſouth of Throckly, and of Heddon Hill, and north of Cloſe Houſe, ſo as to be perfectly out of ſight of it; but as the continuance of the level requires ſkirting the face of the declivity,

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it ſhould then go rather ſouthward, and in front of the farm houſe to the weſt of Cloſe Houſe. A line apparently offers north of that farm houſe, which I tried, as Mr. Bewick conceived it would be more convenient to him; but it unfortunately would require upwards of forty feet ſinking, on an avarage, for above a quarter of a mile.

Whittle Dean appears the moſt formidable obſtruction on the whole line, as it is both very deep and wide where the line approaches its banks, (viz.) immediately oppoſite the mill, but on going rather more than a quarter of a mile upwards, its banks become precipices nearly approaching each other, and afford an eaſy paſſage, attended however with paſſing along the face of a ſteep bank on the ſouth ſide, and about five hundred yards of twenty feet cutting. No other difficulty occurs worth mentioning, untill we arrive at the ſcar on ſteep ground mentioned in my former report, as lying between Bywell and Corbridge, and this difficulty I found far leſs than I expected, and comparatively trifling, owing ſolely to the circumſtance of having ſufficient elevation.

From Whittle Dean, the line goes cloſe to the ſouth of Ovington, about three quarters of a mile north of Bywell; and within a quarter of a mile of Styford, where conſequently the carriage from the adjacent Country, ſouth of the Tyne will come in.—The town of Corbridge is approached to, within between two and three hundred yards; at the diſtance of leſs than nineteen miles by the Canal from Newcaſtle; and cloſe in the vicinity of the Lime-kilns.

From Corbridge weſtward, the line will paſs below

Sandoe

Sandoe, Beaufront, and Anick; and nearly *400 yards north of the Brewery at the end of Hexham-bridge.—Here, for ſome ſpace, on the eaſt and weſt, the ſoil lies only about half a yard deep on a freeſtone, which is of little conſequence, as it will only be neceſſary to form this part of the line, in a low embankment—The line, in its progreſs weſtward, then paſſes conſiderably north of the Hermitage, and meets a material obſtruction in the projecting ſteep land of St John Lees —To paſs round the face of it would be difficult; not only on account of its ſteepneſs, but the very ſharp turns in its angles: Therefore, if the hill at the level of the Canal, ſhould conſiſt of freeſtone or any thing eaſily perforated that will ſtand without arching; it may perhaps be eligible to tunnel through it; but this will depend on minute inveſtigation, and can only be adviſable if attended with a conſiderable ſaving—Thenceforward the line paſſes cloſe to the weſtward of the village of Acomb, and approaches the North Tyne a little above Nether-Warden; but to paſs it, it becomes neceſſary to go up the Vale oppoſite to Warden Mill, where the river runs over a bed of rock confined by precipices on each ſide; which of courſe afford an eaſy paſſage over the River, although the bed of it lies ſeventy feet below the level of the Canal—Hence it paſſes north of Nether-Warden cloſe to the village; and there encounters, for a quarter of a mile, the paſſage along the face of ſteeply declining ground—After which the line is remarkably favourable, to as far as the ſteep ground on the river edge between Allerwaſh and Capon-cleugh

* At croſſing the North Road here, the *diſtance on the line of Canal* is twenty two miles and three quarters.

cleugh Burn.—In its courſe to this place the line paſſes a quarter of a mile ſouth of Fourſtones;—juſt to the north of the Mill at the foot of Newburgh Burn; and between Allerwaſh and the Tyne.—The ſteep ground between this and Caponcleugh Burn is more formidable in appearance than reality; as the South Tyne now approaches towards the level of the Canal; and there is ſome flat ground at the foot of the bank, which is prevented from waſting away by the bed of the River being Rock.—The line then paſſes under Altonſide; and excepting a little deep cutting * ſhort of the Burn ſouth of Haydon Church, meets no obſtruction to as far as the termination of the flat ground below Haydon Bridge: And here, after a courſe of thirty miles and three quarters the level ceaſes; *the South Tyne immediately riſing above it.*——The termination of this *long level of Canal*, making a natural diviſion of the line, I ſhall defer deſcribing its progreſs weſtward until I have made ſome obſervations on this portion of it.

Wherever various lines may be carried through a country, there will generally be ſome peculiar advantages attached to each; and as they cannot all be attained by one line; the choice of courſe ſhould fall upon whichever combines the greateſt ſhare. This, in the preſent inſtance, I conceive to be *the line running upon the high level of Newcaſtle;* for reaſons that I will afterwards ſtate.

But if the advantage of going off *high* from Newcaſtle be foregone; then either ſide of the Tyne may be departed

* This ariſes from the encroachment of the River, and the inconvenience will encreaſe, unleſs the north bank be protected there.

ed from, at their reſpectively moſt convenient places near the termination of the tide-way. On the northern ſide, no advantage by purſuing the navigable part of the River could be acquired, except the ſaving of nearly *four miles and a half of eaſily cut navigation*, which is many times compenſated for by the advantages which, I hope to make appear, muſt reſult from *retaining ſuch height*, in deſcending from the ſummit between the two Seas, as will reach Newcaſtle at the greateſt elevation, and on the longeſt continued level.—If the River Navigation be purſued to Lemington, the line now propoſed from Newcaſtle would probably have to be acquired pretty rapidly, becauſe precipices on the Rivers bank render it difficult to keep there; and to go *barely* above theſe precipices, other obſtacles would ariſe from numerous deep ravines cut by ſmall rivulets; which *ceaſe to have deep channels on the level of Newcaſtle*.

If the difficulties on either ſhore, after departing from the Tyne, ſhould be equal or nearly ſo; the ſouthern ſide would claim the adv antage from its greater abundance of heavy products.—I apprehend however that it will be found attended with conſiderable difficulties, if ever any regular plan and ſection ſhould be produced; but from a line drawn upon a bare copy of the outlines of the map of the county ſhewing neither hill nor vale to direct the judgment; no juſt concluſion can be drawn.

If, as Mr Dodd has aſſerted, a line may be carried beyond Prudhoe with a riſe of four locks only; it may, ſhould even nature put a barrier to its further

continuance, be eligible for the proprietors of Collieries, in this part, and other ſubſcribers, to form ſuch navigation, as it would in all probability pay well; although I do not think it would be eligible to make it ſo *for keels*; becauſe keels, entering this navigation, muſt inevitably loſe a tide; and veſſels of larger burthen, *navigated much cheaper, in Canals of leſs requiſite magnitude*, might carry *the coals at a ſmaller expence*, and without more change of immediate vehicle.—I will not however ſay that ſuch a Canal as he recommends can ever anſwer the end he propoſes viz. one of five feet depth of water, eighteen feet width of bottom, and twenty-eight feet of ſurface *(which is coincident with ſlopes of* 45°) to carry veſſels of eighteen feet width of beam and four feet ſix inches, to four feet eight inches, draught of water.

In the firſt place, the ſoil through the Haughs and on the banks above them is looſe, and to talk of its ſtand at 45°, or a ſlope of *one foot* baſe to *a foot in height*, is abſurd; even in water expoſed to little agitation. The uſual ſlope of the banks of Canals, is from *ſixteen to twenty-one inches baſe* for *each foot in height*, according to the tenacity of the ſoil. The ſection of the Canal, thus recommended by Mr. Dodd is preciſely one hundred and fifteen feet, and the ſection of the navigating boat, *or keel*, of nineteen feet beam and four feet ſix inches draught of water, I preſume will be under calculated at ſixty feet, but ſay half the ſection of the Canal.

Now it muſt indiſputably be admitted, that when a boat moves its own length, from any point in a Canal, ſuppoſe

ſuppoſe from the head of a lock, it leaves a vacuity to be filled up, equal to the water its bulk diſplaces; which can be ſupplied no where, in this caſe, but from its front; therefore if the boat fill up half the ſection of the Canal, it neceſſarily follows, that every time ſhe moves her own length, the water muſt ruſh* as faſt backwards by the banks of the Canal, to fill up the vacuity, as the boat advances forward. Conſequently, as the reſiſtance in paſſing through fluids is as the ſquares of the velocities, and *the boat has to go twice as faſt through the water as along the land*; it follows, that to go at any given rate, it will require four times the force it would do to drag the boat through water of comparatively indefinite width and depth; yet this is not the worſt of its effects, for the water ruſhing with ſuch rapidity along the ſhore of the Canal, and forming at the ſame time a riſing wave, *tears away the banks of even the flatteſt ſlopes*, and rapidly raiſes the bottom ſo as to render it *un-navigable for veſſels of the originally intended depth*. From this cauſe, experience

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* This is only ſtrictly true on the ſuppoſition that the boat is of a uniform ſection from Stem to Stern: but in the preſent inſtance is compenſated for by reduction of the boats ſection, which alſo counterbalances another circumſtance, diminiſhing the full effect deduced from theory; which event takes place when the boat is at a conſiderable diſtance from the extremites; as then the water in front of her will partly recede without riſing to its full oppoſition, aud that in the rear partly come in to fill up the Vacuity.

† Every ſailor knows that when a veſſel comes near to *(or in the ſea phraſe,) ſmells* the ground; a material difference in her velocity takes place

ence has taught the neceſſity of Canals being, in width and depth, conſiderably beyond what is ſimply requiſite for the boat to float in with eaſe. That any perſon ſtyling himſelf a *Civil Engineer*, ſhould *be thus groſsly ignorant of the rudiments of that profeſſion*, I can not readily admit, *becauſe it would indicate* that the party had neither conducted or particularly attended to Canals, and was inſulting the public by pretending to be what he is not. I therefore am happy to be able to *unravel this ſeeming myſtery*, by having recourſe to a work, which, to the loſs of ſcience and polite literature, has not been ſufficiently promulgated, or it would be readily known I could only allude to the elegant treatiſe on Sunderland Harbour, in which may be found the authors † opinion of the *judgement of the gentlemen of the northern counties*, and of the *great requiſite that has hitherto procured from them* the employment that he looks for, and of courſe the *non-neceſſity* of diſplaying his real abilities.

I deſigned to have paſſed over, in ſilent contempt, the various witticiſms of Mr. Dodd, with his miſrepreſentations and unfair ſtatements from my Report, and to have refrained from attacking him in his many vulnerable

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place, and at the ſame time the water becomes muddy or diſcoloured; which ariſes from the counter current under her bottom. The ſame event takes place in Canals but in a greater degree; by the water being confined alſo in the ſides.

† Vide Dodd's report on Sunderland harbour, page 37. line eleventh &c. "I wiſh moſt ſincerely more attention was paid to our ſea-ports" "My ideas are not merely fixed to *the northern*, but alſo to *the weſtern parts* of this kingdom: I have often obſerved that their expenditures have been *conducted by men inadequate* to the taſk; *whoſe preſumption not their abilities*, have hurried them into ſuch arduous undertakings."

places, which I have only done in this ſingle inſtance; hoping, that it may be ſufficient to prevent any portion of the public from being miſled, by dogmatical and unfounded aſſertions on a ſubject they have not had the opportunity of being ſufficiently acquainted with; and that my paſt and future ſilence on any of his hoſtile obſervations, may not be conſtrued into inability to refute them.

The extent of the difficulties that would accrue in carrying the navigation on the ſouth ſide, all the way to Hexham; and ſo much farther, as the nature of the country will admit, I cannot ſpeak to preciſely: but I am clearly of opinion, that to give ſatisfaction to the parties that are intereſted in that ſide, as well as to enable the public at large to determine more decidedly, it would be proper that they were critically examined: becauſe if not eligible as a part of the great line, a Canal to ſome given extent might perhaps be adviſable, as I have already mentioned.

Another line, offered in competition with both ſides of the Tyne, is from Newcaſtle Town Moor, by the Vale of Pont; and as ſeveral advantages might have been attendant on this line, *if eaſily practicable*, I was induced to examine the ground between the heads of Pont and the branches of Erringburn; and the reſult confirmed what I had before advanced, that this ground (through which that line muſt either go, or return, into the Vale* of Tyne, between Halton and Stagſhaw-Bank) was far too high.

The

* The conſequence of returning into this vale would be a deſcent to ſuch level as the North Tyne could be croſſed upon.

The apparently loweſt paſs, is on the north of the great hill that lies immediately above, and to the eaſt of the church of Bingfield; and this paſs is ſo high, that there is no alternative, but to deſcend to a ſuitable level for the continuation of the line weſtward: or to ſkirt to the northward of Hallington Hall, and Swinburn Caſtle; and ſome miles up the North Tyne, and north-weſt of Chipchaſe; and after returning by Wallwick, to croſs towards the vale of the South Tyne, ſomewhere between Newbrough and Fourſtones:—The impropriety of either of theſe ſchemes, is ſo evident as to preclude the neceſſity of further argument.

I have already obſerved in my former report, that the quantity of deſcent to be encountered from the ſummit to the ſea, muſt *evidently be the ſame*; *whatever line be purſued*; but that *much depends on where that deſcent ſhall be*.—And I have ſeen ſo *many inconveniences* in a variety of Canals, *from making that deſcent* TOO SOON that I have adopted it as a maxim, never to part with *height of level* without fully ſufficient cauſe.——The poſſeſſion of height enables various lateral branches to be made, that could not otherwiſe be carried into effect, without an almoſt inſuperable aſcent, and a ſupply of water that often cannot be acquired:—it alſo frequently enables the further, and perhaps unthought of continuation of a line that otherwiſe would never proceed, becauſe of the neceſſity of a ſecond ſummit (which, where ſubſequent deſcent is requiſite, requires a new ſupply of two lock-fulls of water for every boat that paſſes,) and the delay, neceſſarily occaſioned by a great number of

§ Page 40, line 6th from the bottom.

Locks, which would totally cut off many advantageous ſources of revenue.

In my laſt report § I alluded to advantages that would ariſe from bringing the Canal to Newcaſtle on a *high level.*—The chief of them is, the opportunity afforded of continuing the level along the eaſt ſide of Newcaſtle town Moor; and from thence, as far as neceſſary, through the centre of the fertile part of Northumberland:—the conſequences of which would be, not only commerce enough on that particular line to pay its proprietors, but a great addition to the income of the other.

The part of Northumberland that I ſuppoſe this level will run through is a great tillage country much in want of lime; there not being both limeſtone † and coal eaſily to be obtain'd, at any convenient diſtance.—Now at the village of Wall, and in the the diſtrict of country north of it, which all lie near to where the Canal ſhould paſs the North Tyne, there are inexhauſtible quarries of limeſtone without any cover upon them which by a rail-way could eaſily communicate with the Canal; from which they would be ſupplied with coals at an eaſy rate, and be enabled to ſend *lime* back; which; from being only about half the weight of the limeſtone,‡ would make the carriage eaſy to almoſt any diſtance.

This part of Northumberland is, I ſuppoſe, at leaſt *half under tillage*;——and admitting the fallow to be one-third of the tillage, and four tons of lime to be uſed to an acre, there would annually

† In ſome parts near this ſuppoſed line there is limeſtone, but lying under much cover and not eaſily laid dry; and alſo ſeams of coal, but very ſmall and inſignificant.

‡ Admitting the ſtone to be perfectly calcarious.

ly be conſumed on a ſquare mile, or ſix hundred and forty acres, four hundred and twenty-five tons of lime, excluſive of what would be required for the towns and buildings, which would be very conſiderable.—But calling the whole conſumption but four hundred tons per ſquare mile; and allowing the Canal to be carried *only fifteen miles* northward, and its influence to extend nothing beyond it, and only four miles on each ſide; there would then be a demand for forty-eight thouſand tons of lime; which, paſſing through twenty-four miles of the great weſtern Canal, would, at a penny per ton per mile, leave a revenue of four thouſand eight hundred pounds a year. A proportionate revenue, ſuppoſe on the average conveyance of eight miles, would accrue to the northern Canal, which would amount to one thouſand ſix hundred pounds;—and another ſource would ariſe from Newcaſtle becoming the great emporium for the produce of the tillage, both for conſumption and export. The average weight of that produce in all its different articles*, will, I preſume, be not over-rated at one hundred and ſixty tons per ſquare mile. The carriage at the beginning will be little, but it will extend wide and diſtant at its extremity; and many be accounted at leaſt equal to three-fourths of what I have allowed in the former article, (viz.) to ninety ſquare miles, which of courſe will give fourteen thouſand four hundred tons; and as the articles

* Grain, potatoes, turnips, &c. &c. rated thorughout at five hundred weight per acre, as ſpare produce beyond the conſumption of the immediate country. This will be more or leſs than the truth, according to the quantity of tillage, and the article cultivated.

ticles will come moſtly from the extremity, will average, as to quantity and diſtance, perhaps twelve miles, but ſay only two-thirds of the whole diſtance, or ten miles; and then at the low rate† of three halfpence per ton per mile, the tolls will amount to nine hundred pounds. The carriage of coals would alſo be conſiderable. And the influence of Canals, *unleſs interfered with by ſimilar products to thoſe conveyed*, extend further beyond them, than laterally; and the lateral effect alſo *encreaſes with the diſtance from the places where the article is conveyed from, or may be otherwiſe obtained.*

Home and foreign timber, oppoſite ways; deals iron, &c. &c. and the benefit of market and paſſage boats, which would come uninterruptedly, may be allow'd equal to the ſum laſt eſtimated; and then it will be found that, excluſive of the land-holders in the line of country through which that Canal would paſs, there will be ſufficient inducement for the public to venture in this undertaking, even ſhould I be miſinformed as to the extent of the facts from which I draw my concluſions; and therefore, this advantage, *which can be derived no other way but from the high level to Newcaſtle*, and may be extended further than I have calculated, ought not to be foregone—When to this is added the great benefit of paſſage-boats along the whole line, and of market boats, as mentioned in my former report, it will be found that the tolls that would be *peculiar* to this line, *excluſive* of what it would enjoy *in common with the others*, would pay the adventurers

† Leſs toll is generally charged on Canals than they are entitled to by their reſpective Acts of Parliament, unleſs peculiar circumſtances render it otherwiſe, becauſe they find, that by benefiting the country they encreaſe their commerce and benefit themſelves.

adventurers very amply.—And there can be no compariſon; as to the benefits to be derived by the town of Newcaſtle; which circumſtance *being conducive of, and not militating againſt the general intereſt*, ought *particularly to be attended to.*

As to the conveyance of lead from, and of articles up to the lead Mines, I conceive there will be no eſſential difference, as all the great roads from the ſmelt Mills, lead acroſs the country to the bridges on the Tyne, and the diſtance between the two lines is too inconſiderable to cauſe any difference in expence.—The inhabitants of the town of Hexham, probably, think the ſouthern-ſide would tend more to their advantage, as the baſon would be near to them; but let them conſider in what the commerce of their town conſiſts (viz) in gloves, felt hats, and garden ſtuff.—A few cart loads in a Month, will be equal to all their produce, in the two former articles; and therefore the extra charge of carrying them acroſs the bridge can be of little conſequence; and the ſame inconvenience in their groceries, timber, and even of their coals, can be of no great moment; but it is decidedly different with their garden ſtuff, which is moſtly diſpoſed of at Newcaſtle:—for, with the Canal *on one level* on the northern ſide; in place of ſetting off with their carts for Newcaſtle in the afternoon to be at the market the next morning, and conſequently being abſent a night and a day, they will only have to ſend *theſe articles aboard the market boat in the evening*, and to *ſet off in them the next morning*, when they will be certain of arriving *at the given hour*, at the baſon above the Weſtgate; from whence, as it is all down hill to the market, carts eſtabliſhed at regulated prices, will convey theſe articles at a very trivial charge,—Not ſo by the Canal on the

ſouthern-

ſouthern-ſide; as there can *be no certainty of the arrival of market boats*; which would be delayed by the paſſage of numerous Locks, and a circuitous and uncertain Navigation in the *tideway* to the foot of the Town, from whence every thing would have to be carted up-hill.

It has been aſſerted that no water can be got for the line I have recommended; but let it be conſidered that it will need none, *except for leakage and evaporation*, as the locking down to the tide-way may very obviouſly be defered, until the completion of the Canal acroſs the kingdom; and in the interval, no material inconvenience could ariſe, as only a ſmall portion of the articles would go directly to or from the ſhipping on the river; and as to what would be ſtored, it could make little difference of expence in cartage to and from any part of the town.

In carrying forward the line from Newcaſtle to the weſtward, numerous ſmall unoccupied ſtreams would have to be croſſed; which, though ſeparately very trivial in dry ſeaſons, would conjunctly be equal, at leaſt, to the evaporation of the Canal; there are alſo, between Ovington and the North Tyne, others more conſiderable that ſhould be ſuperior to any leakage, particularly as a Reſervoir may be formed of Sheldon Lough, for water ſufficient for all the waſte of the Canal in any uncommon drought. And at the extremity of the level at Haydon Bridge, *any portion of the Tyne may be taken in that may be requiſite.*

It is perhaps neceſſary for me to ſay why I recommend the continuance of the level to Haydon Bridge, in place of bringing the ſummit level eaſtwards to near the North Tyne, as conditionally recommended

in

in my former Report, (viz.) "if no particular diffi-
"culties intervened."——On the principle of affording a future communication up the Vales of Reed and North Tyne, (where I am informed there is a proſpect of heavy products) I tried the continuation of the ſummit level to the eaſtward; but finding beſides other difficulties, an inſuperable barrier in the deep vale of Capons-cleugh, I relinquiſhed the Idea; and attended to the next great object, which was, carrying the Newcaſtle level as far weſtward as poſſible; which very fortunately runs to a moſt valuable termination for the lead Mines:—to Haydon Bridge.—And as to any future communication with the vales of Reed and North Tyne, it may be made by the ſmall ſpecies of Canal I have mentioned; terminating on the high ground above Newbrugh; and, conſequently, attended with a ſhort portage.—On a ſimilar principle, lines from the lead country might terminate on the high land, on the ſouth ſide of the Tyne, between Allan Foot and Langly, whenever ſuch lines might be deemed neceſſary.

At preſent I ſhall ſay nothing relative to the eſtimate of the expence between Haydon-Bridge and Newcaſtle; both becauſe I have not yet had time to make it; and that I wait for the opportunity of conſulting with Meſſrs Jeſſop, and Whitworth, on the moſt eligible dimenſions of the Canal; and on other circumſtances, on which the amount of the eſtimates will more or leſs depend.

One circumſtance, hitherto ſlightly mentioned, I have to take further notice of, before I conclude:—I mean the courſe of the Canal through part of Mr Errington's demain.—

demain.—The courſe of it would be at the foot of the high ground of Beaufront; and would then turn off to the ſouth below the foot of the garden; therefore ſhould Mr Errington, in conſideration of the benefit it would be to himſelf and the country, be brought to acquieſce to its going through his demain, it might be made a very beautiful object from the houſe by its commanding *a view of two reaches*; and from the Canal receiving *ſuch form or extenſion, as to give it as beautiful an appearance as it it capable of.*—It alſo might be inſulated from his demain, *by ſunk fences*; and *the communication on each ſide kept open by ornamental ſubterraqueous arches.*

Of the circumſtances attendant on the continuation of the line to the weſt ſea, I ſhall, as ſoon as poſſible, publiſh a particular account.

I am,

GENTLEMEN,

Your obedient humble Servant,

WILLIAM CHAPMAN.

26 FE 66

Newcaſtle, June 26th 1795.

SUBSCRIBERS TO THE SURVEY, OF A LINE OF NAVIGATION BETWEEN THE EAST AND WEST SEAS.

FINIS.